PORTABLE, FOLDABLE ELECTRONIC DEVICE COMPRISING AT LEAST TWO USE POSITIONS

[0001] The present invention relates to a portable, foldable electronic device comprising an open and closed use position as set forth in the preamble of the appended claim **1**. The invention also relates to a hinge mechanism for a portable, foldable electronic device comprising two or more positions as set forth in the preamble of claim **13**.

[0002] For storing various data, known electronic devices are available, such as notepad computers, small hand-held computers or PDA devices (personal digital assistant). The data can be viewed by means of the display of the device. The data are entered in the devices by means of a keypad or a touch screen. Also wireless communication devices, such as mobile phones, comprise a keypad and a display for storing or selecting telephone numbers. Known devices include Nokia® 8850, 77110 and 6110 mobile phones. Devices are also available having two different user interfaces, normally the user interfaces of a mobile phone and a PDA device. One such known device is Nokia® 9110 Communicator, whose first user interface (opened position) is a PDA user interface and second user interface (closed position) is a CMT user interface (cellular mobile telephone) for mobile phone functions. The device comprises separate keypads and displays for the different user interfaces. The device comprises two housing parts hinged to each other. On their their inner side, the PDA user interface of the the device is protected between the housing parts in the closed position of the device. The CMT user interface is on the outer side of one housing part.

[0003] A PDA/CMT device comprising two user interfaces and two different use positions is also known from U.S. Pat. No. 6,014,573. In the closed position, the device is used as a mobile phone, and in the opened position, a separate keypad and display are available. When opened, it is also possible to have e.g. a wireless connection to a communication network and to search for information by means of a browser or communication software in the device. A PDA/CMT device comprising two or more foldable housing parts is also known from U.S. Pat. No. 6,047,196. The CMT user interface is placed on the outer sides of both housing parts. One embodiment of the device also comprises a wide display which is divided into two foldable housing parts. A corresponding wide display comprising two foldable housing parts is also known from the patent publication U.S. Pat. No. 5,734,513. When the housing parts are closed, the displays remain protected therebetween. The separate displays are placed next to each other to form a wider uniform display.

[0004] It is known that devices comprising a CMT user interface only can also be provided with auxiliary functions, for example a camera, as disclosed in the application publication EP 0 963 100 A1. Electronic images produced with the camera, for example still images or video images, can be transferred to the display of the device or be transmitted in a wireless manner elsewhere in the communication network and to other CMT devices. A particular problem is induced by the placement of the camera also in the PDA/CMT device to make the use of the camera possible and simple in different positions of the device.

[0005] In known PDA/CMT devices that can be opened and closed, a problem is the placement of keys or corresponding control buttons, cursor keys, rotatable rolls or balls, rocker buttons or navigation keys in an optimal way for the use. A particular problem lies in two interfaces which are used in different positions of the device, wherein the grip of the user's hand should be simultaneously changed and/or released to make the use comfortable and to make opening of the device even possible. When opening and changing the grip, both hands are often needed. The keys for several different grips must be placed within reach of the fingers, but at the same time, they often require space e.g. on the display. To facilitate each grip, the device comprises several separate keys for the same function. When browsing, wide displays are preferable, wherein they extend even to two housing parts when the devices become smaller. To make the use of the device comfortable, the placement of the keys and the holding positions should be ergonomic. It is problematic to implement control keys for other integrated auxiliary functions and positions in PDA/CMT devices whose size is continuously reduced.

[0006] It is an aim of the present invention to provide an improvement to the prior art. In particular, the aim is to present an improved electronic device comprising at least two user interfaces, preferably a PDA/CMT communication device. The aim is to considerably facilitate the use of the device by making its handling possible with the grip of one hand both in the opened and in the closed position. In particular, the aim is to open the housing parts of the device without changing the grip or the orientation of the device. In particular, the aim is to place the keys or the like in such a way that the PDA/CMT functions of the device can be used without changing the grip and preferably in the same way by both the left and the right hand.

[0007] The device according to the invention is characterized in what will be presented in the characterizing part of claim **1**. The hinge mechanism according to the invention is characterized in what will be presented in the characterizing part of claim **13**.

[0008] The invention is based on a handle-like housing part which is added to foldable housing parts and in which the keys and other control buttons or the like are placed. The invention is also based on the way in which the other housing parts are folded in relation to this handle part. The handle part can be designed for an ergonomic grip. When the control buttons are placed on different sides of the handle part, and a navigation key which is preferably also equipped with a push-button function is placed on the upper corner of the device, the device can be controlled with one grip. The device can be opened with a push-button on the top surface. The same keys can also be used to control the auxiliary functions, such as camera, video and music functions.

[0009] A particular advantage is obtained when the aim is to transmit a video image of the user during a call, wherein the closed device can be easily and quickly opened to answer a video call. By means of an image sensor in the device, it is possible to create images in electrical format. The images can be electronically transferred forward and/or displayed on the display of the device. It is not necessary to release the hand from the handle part, wherein the fingers remain on the keys to secure a quick start and control of the functions. The display of the opened device is available for displaying received images e.g. during a video call.

[0010] According to the invention, the lower part of the handle is designed as a crutch. The device remains opened